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Narrative review on use of statistics in nursing

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Abstract
Nursing Research published each year continues to grow, as does the expectation that nurses will undertake practice based on this evidence. Critical care Nurses do not need to be a statistician, but they need to develop a working knowledge of statistics so they can be informed consumers of research and so practice can evolve and improve. Use of evidence based Nursing practice has increased dramatically and the standard for health care decision making. In Nursing, there has been an explosion in knowledge during the past 20 years, thus providing the discipline with diverse and multifaceted theoretical frameworks and practice paradigms. Knowledge- based practice as the integration of knowledge of the best available research. Nurses make decisions as part of their practice, is empirical science, with its reliance on quantitative data and the interpretation of statistical results.

Keywords: statistics, nursing

Introduction
The root of the word statistics comes from the Italian word "statista" meaning statesman and the German word "Statistik" meaning political state. It was for the first time used by Gottfried Achenwall, a professor in Marlborough. Statistics can be defined as collection, presentation, analysis, and interpretation of numerical data. Statistics in health sciences are used to define normal and abnormal context of various aspects related to health and illness, to establish the accuracy of the diagnostic procedures, to observe the natural history of a disease namely its signs, symptoms, course, variation etc, to assess the treatment protocol and different interventions used for care and treatment of the patients and to collect, analyse and dissemination of various population health statistics [1].
Statistics can be descriptive or inferential. Descriptive statistics are used to describe and synthesize the data. When a percentage or other descriptive statistic is calculated from population data it is called a parameter. A descriptive index from a sample is statistic. Research questions are about parameters, but researcher calculates statistics to estimate them and use inferential statistics to make inferences about the population [2].
The use of quantitative and mixed methods research in nursing practice has increased the requirements to provide statistical results. Nurse researchers need to understand and report results of their studies using appropriate statistical methods. It is not realistic to expect all nurses to be expert statistician, nor expect statistician to have the clinical insight and knowledge of the clinicians. What is achievable is a dialogue between the two groups, an importance of understanding the problem from both sides, and a willingness to understand the knowledge of each other's domain [3].
Strong research evidence will however support the implementation of evidence –based interventions in practice. Whereas weak evidence may indicate a need for further research. Knowledge of basic statistics is therefore essential and will help the nurses to understand and assess the credibility of the evidence presented [4].

Methodology
Search Strategy Methods
A computerized search has done to collect the articles which are available in different databases from the year of 1995 to 2017. The search strategy was limited to only English language and considered only the studies which are conducted on human species.
Initial search strategy made by using the terminologies and its synonyms which are processed in databases such as Pub Med-Medline and EBSCO, the key words along with the synonyms were added in the MESH after that search builder was developed based on key words and later on the main search was done.

Types of Studies
Survey research studies, Non-experimental and mixed-method studies, Narrative reviews and Review articles.

Type of Participants
Undergraduate Nursing students, Clinical Nurses.

Setting
Hospitals, nursing schools

Data Extractions
Denis. C. Visentin, Glenn E. Hunt (2017) [3] has reviewed on improving the report of quantitative nursing research among mental health nurses and the problem identified the use of statistical methods and techniques has generally

improved in papers submitted for publication over the past decade, unfortunately the correct interpretation or proper uses of more advanced statistical methods has often lagged. It is likely that there is link missing between the capacity to perform appropriate statistical analysis and the ability to interpret the clinical relevance of the study. Most Mental Health Nurses will have expertise on clinical aspect of the study, but are less likely have the required statistical expertise or confidence to analyse the results by themselves. A greater improvement can be sought in improving communication and collaboration between the clinical researcher and statistical analyst, so the statistician must take an interest in clinical relevance and Mental Health Nurse must take an interest in statistical methods and results [3].

Maria E. main, Veletta L. Ogaz (2016) [5] reviewed the article on Common statistical Tests and Interpretation in Nursing Research and the purpose of article was to review basic statistical concepts, define common statistical tests, and interpret the results of common statistical tests. The conclusion of the review article was Evidence-based practice in faith community nursing, like other areas of nursing practice was vital to the provision of high quality health care. Knowledge of statistical concepts and common statistical tests assist in the appraisal of nursing research for evidence-based practice [5].

Allen Mc Lean (2016) [6] has done a review on Nursing, Software and Statistics and Nursing Knowledge based on empirical research plays a fundamental role in development of evidence-based nursing practice. There are many statistical packages available for nursing research available in at least a basic version often offering everything a nurse will need for even complex statistical analysis. Understanding of the fundamentals of statistical analysis combined with current statistical software packages is very important for nursing profession in evidence-based nursing research in health care community [6].

Brad Hagen, Olu Awosoga, Peter Kellett, Samuel Ofori Dei (2013) [7] conducted Pre-experimental research design on Evaluation of Undergraduate nursing students' attitudes towards statistic courses, before and after a course in applied statistics.104 third year nursing students of four year nursing programme was included in the study. The surveys were administered in a paper and pen format to all nursing students scheduled to take statistics for the current semester and second survey was done to them at the end of the semester after they had completed their course in statistics. The results of the study were students reported moderate anxiety towards statistics and student anxiety about statistics had dropped by approximately 40% by the end of the course [7].

Zoe Hoare, Juanita Hoe (2013) [4] reviewed article on Understanding quantitative research Nursing standard. Critical appraisal of research studies is essential to ensure that nurses remain up-to-date with evidenced –based practice to provide consistent high quality care. Understanding statistical analysis will ensure that nurses can assess the accuracy and strength of the evidence reported. An understanding of basic statistics will help nurses to interpret the strength of findings. This article concluded that to encourage the nurses to build their knowledge of statistics and take advantage of opportunities to use when appraising the evidence of research papers [4].

Iris Epstein, Elaine E.Santa Mina, Julie Gaudet, Mina D. Singh, Tarsa Gula (2011) [8] has done Integrative review o teaching statistics to undergraduate Nursing Students. The widespread application and interpretation of statistical analysis in research articles across a variety of International nursing journals highlights the value of teaching statistics to nursing students. As nursing care becomes more complex, the value for nurses to appropriately use statistics in the context of Evidence Based Practice is Vital [8].

Clarie M. (2008) [9] has done a review on statistics for clinical nursing practice and the summary of the article was difficulty in understanding statistics is one the most frequently reported barriers to nurses applying research results in their practice. Critical care nurses do not need to be statistician, but they do need to develop a working knowledge of statistics so they can be informed consumers of research and so practice can evolve and improve [9].

Karen K. Giuliano, Polanowicz (2008) [10] has reviewed article on Interpretation and use of statistics in Nursing Research and her article revealed that statistical analysis is required to incorporate the findings of empirical research in to nursing practice. Nursing knowledge based on empirical research plays a fundamental role in the practice. The ability to interpret and use of quantitative findings from nursing research is essential skill for advanced practice nurses to ensure provision of the best care possible for the patientsx [10].

Kathleen Zellner, Connie J Boerst, Will Tab (2007) [11] has reviewed on Statistics used in current Nursing Research and they concluded that widespread use of statistical Methods in a variety of nursing journals underscores the importance of including statistical skills in nursing education. Nursing research becomes more sophisticated, it is clear that greater understanding of the techniques and issues of quantitative study needs to emphasize. The nursing profession should continue to move forward in the use of more advanced statistical analyses including logistic regression and power analysis [11].

Trevor Sheldon (2000) [12] has done a review on statistics for evidence-based nursing and article revealed that health care professionals and policy makers are increasingly aware of the ne for their decisions to be informed by the best available research evidence. Evidence based Nursing have already been appraised and only the highest quality research selected practitioners still need basic skills to identify and interpret methodologically sound research [12].

Summary of the findings

There are five articles revealed that Nurses must have the thorough knowledge regarding statistics and its application Nursing knowledge based on empirical research plays a fundamental role in the practice. The ability to interpret and use of quantitative findings from nursing research is essential skill for advanced practice nurses to ensure provision of the best care possible for the patients. One review states that the nursing profession should continue to move forward in the use of more advanced statistical analyses including logistic regression and power analysis. One article stated that imparting statistics course for the Nursing students will reduce the anxiety by 40% related to statistics. One article revealed that there should be communication and collaboration between the Nurse Clinician and statistician for the better results.

Limitations

Data search was limited

Search strategy was refined to use of statistics in Nursing.

Conclusion

It is importance for the Nurses to use statistics nursing knowledge based on empirical research plays a fundamental role in the practice. The ability to interpret and use of quantitative findings from nursing research is essential skill for advanced practice nurses to ensure provision of the best care possible for the patients.

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